On the Coagulation Theory of Colloids and the Coalescence of Mercury Droplets in Aqueous Solutions

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Abstracts of the Papers Published by the Staffs of This Institute in Other Journals

Infrared Absorption Spectra of Some Monovalent Metal Salts of Fatty Acids

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Nippon Kagaku Zasshi (Journal of the Chemical Society of Japan, Pure Chemistry Section), **84**, 392 (1963)

Infred absorption spectra of lithium, sodium, potassium and silver salts of fatty acids of different chain lengths have been measured from 4000 to 400cm^{-1} in solid states as well as in aqueous solutions except for silver salts. In solid states, the absorption bands of the alkyl group are affected mainly by the chain length, whereas those of the carboxylate ion by the sort of metal salts. The changes in the frequency and appearance of those bands have been discussed in connection with the effect of the carboxylate and the metal ions and also with the change in the molecular configuration in crystals. In aqueous solutions, the spectra of the salts are independent of the metal ion and the bands assigned to wagging (or twisting) and rocking vibrations of the methylene group are very diffuse as compared with those in solid states. These facts show that in aqueous solutions the $C_nH_{2n+1}COO^-$ ion is free from the metal ion and the methylene groups in the alkyl chain are spinning freely about the C-C bonds.

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Rempei GOTOH and Akira WATANABE

Nippon Kagaku Zasshi (Journal of the Chemical Society of Japan, Pure Chemistry Section) **84**, 480 (1963)

The Verwey-Overbeek theory of coagulation of hydrophobic colloids, which was derived on the basis of the free energy of interaction between colloid particles, has already been examined experimentally by various authors by using silver iodide sols. However, none of them has so far been carried out under the condition in which the electrical potential of particle surfaces and the ionic strength of the

medium were well-defined. In the present experiments, the potential ranges of polarization of a pair of dropping mercury electrodes, over which the two mercury droplets coalesced, were measured as functions of ionic concentrations for various electrolytes. In the case of simple inorganic electrolytes the condition of coalescence obtained was proved to be in quantitative agreement with the Verwey-Overbeek theory, thus indicating that the interaction between sub-microscopic particles of hydrophobic sols is essentially the same as that between macroscopic mercury droplets. While, in the case of sodium citrate solutions two kinds of marked deviations from the theory were observed, which appeared to be due to the specific adsorption of citrate ions and to the formation of protective interfacial films.

Internal Conversion of the 1277keV Transition in ^{22}Ne

Yasuyuki NAKAYAMA and Haruyoshi HIRATA

Nuclear Physics, **40**, 396 (1963)

The internal conversion coefficent of the 1277keV transiition in ^{22}Ne has been measured using the Siegbahn-Slätis intermediate image beta ray spectrometer. The measured value of $\alpha_t = (6.77 \pm 0.45) \times 10^{-6}$ is in agreement with the theoretical value for a pure E2 transition as calculated by Rose and corrected for the screening effect by Hinman.

Studies on Lactone Formation in Vapor Phase. (I)

Synthesis of γ-Butyrolactone

Shinzaburo OKA

Bulletin of the Chemical Society of Japan, **34**, 12 (1961)

Vapor phase catalytic dehydrogenation of 1,4-butanediol to γ-butyrolactone with reduced copper copper supported on various carriers has been studied. It was found that copper supported on zinc oxide or magnesium oxide was a superior catalyst. In the case of a catalyst conisting of 20% copper and 80% zinc oxide, the yield and space time yield of γ-butyrolactone were 95% and 0.28 at 230~240° C, respectively. No final information was yet available as to the life of the catalyst, but its activity hardly decreased after several hours.
